

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): An image processing apparatus performing image processing on image data consisting of dot-matrixed pixels, each of the dot-matrixed pixels having color element data from all the element colors, the dot-matrixed pixels being output from an input device which generates the image data by obtaining image data by a single-plate solid image pickup device where a plurality of color filters of element color components are arranged in mosaic in a nonuniform densities and supplementing the image data by calculation to change the nonuniform densities to uniform densities, said apparatus comprising:

a color-blur pixel detection unit detecting a color blur pixel in said image data; and
an image processing unit performing image processing on pixels, each of the pixels having data from all the element colors, the pixels being within a predetermined range having said detected color blur pixel as a reference pixel, so as to reduce a color blur; wherein said color-blur pixel detection unit detects said color blur pixel based on change rate of element color intensity for a low-density color filter, between closely adjacent pixels.

2. (canceled).

3. (previously presented): The image processing apparatus according to claim 1, wherein said color-blur pixel detection unit detects said color blur pixel based on the change rate of difference between a reference element color intensity and the element color intensity for a low-density color filter, between adjacent pixels.
4. (original): The image processing apparatus according to claim 3, wherein if there are a plurality of low-density color filters, said color-blur pixel detection unit detects said color blur pixel based on the change rate of difference between element color intensities for the low-density color filters between adjacent pixels.
5. (previously presented): The image processing apparatus according to claim 1, wherein said color-blur pixel detection unit detects said color blur pixel based on said change rate between adjacent low-density pixels.
6. (previously presented): The image processing apparatus according to claim 1, wherein said image processing unit performs smoothing processing on color difference components, obtained by subtracting luminance components from element color components of the pixels within the predetermined range having said color blur pixel as the reference pixel, and returns the smoothing processed components to initial element color components.
7. (original): The image processing apparatus according to claim 6, wherein said image processing unit performs edge enhancement processing.

8. (original): The image processing apparatus according to claim 7, wherein said image processing unit performs edge enhancement processing on pixels within a range subjected to the smoothing processing.

9. (previously presented): An image processing apparatus performing image processing on image data consisting of dot-matrixed pixels, output from an input device which generates the image data by obtaining image data by a single-plate solid image pickup device where a plurality of color filters of element color components are arranged in mosaic in a nonuniform densities and supplementing the image data by calculation to change the nonuniform densities to uniform densities, said apparatus comprising:

a color-blur pixel detection unit detecting a color blur pixel in said image data; and
an image processing unit performing image processing on pixels within a predetermined range having said detected color blur pixel as a reference pixel, so as to reduce a color blur;

wherein said image processing unit performs smoothing processing on color difference components, obtained by subtracting luminance components from element color components of the pixels within the predetermined range having said color blur pixel as the reference pixel, and returns the smoothing processed components to initial element color components; and

wherein when said image processing unit performs the smoothing processing on the pixels within the predetermined range having said detected color blur pixel as the reference pixel, if the size of a processing object image is large, said image processing unit increases the range subjected to the smoothing processing, while if the size of the image is small, said image processing unit reduces the range subjected to the smoothing processing.

10. (previously presented): An image processing apparatus performing image processing on image data consisting of dot-matrixed pixels, output from an input device which generates the image data by obtaining image data by a single-plate solid image pickup device where a plurality of color filters of element color components are arranged in mosaic in a nonuniform densities and supplementing the image data by calculation to change the nonuniform densities to uniform densities, said apparatus comprising:

a color-blur pixel detection unit detecting a color blur pixel in said image data; and
an image processing unit performing image processing on pixels within a predetermined range having said detected color blur pixel as a reference pixel, so as to reduce a color blur;
wherein said image processing unit replaces a color difference component having a central value of color difference components, obtained by subtracting luminance components from element color components of the pixels within the predetermined range having said color blur pixel as the reference pixel, with a color difference component of said color blur pixel, and returns the color difference components to initial element color components.

11. (previously presented): An image processing apparatus performing image processing on image data consisting of dot-matrixed pixels, output from an input device which generates the image data by obtaining image data by a single-plate solid image pickup device where a plurality of color filters of element color components are arranged in mosaic in a nonuniform densities and supplementing the image data by calculation to change the nonuniform densities to uniform densities, said apparatus comprising:

a color-blur pixel detection unit detecting a color blur pixel in said image data; and
an image processing unit performing image processing on pixels within a predetermined range
having said detected color blur pixel as a reference pixel, so as to reduce a color blur;

wherein said image processing unit determines whether or not said color blur pixel is an
edge pixel, and if said image processing unit determines that said color blur pixel is an edge
pixel, replaces a color difference component having a central value of color difference
components, obtained by subtracting luminance components from element color components of
the pixels within the predetermined range having said color blur pixel as the reference pixel, with
a color difference component of said color blur pixel, while if said image processing unit
determines that said color blur pixel is not an edge pixel, performs the smoothing processing on
the color difference components, obtained by subtracting the luminance components from the
element color components of the pixels within the predetermined range having said color blur
pixel as a reference pixel, and returns the color difference components to initial element color
components.

12. (currently amended): An image processing apparatus performing image processing on
image data consisting of dot-matrixed pixels, each of the dot-matrixed pixels having color
element data from all element colors, the dot-matrixed pixels being output from an input device
which generates the image data by obtaining image data by a single-plate solid image pickup
device where a plurality of color filters of element color components are arranged in mosaic in
nonuniform densities and supplementing the image data by calculation to change the nonuniform

densities to uniform densities, said apparatus comprising:

a memory in which said image data being stored;

a color-blur pixel detection circuit accessing said memory and detecting a position of a color blur pixel based on the difference between a pixel of interest and its peripheral pixel while sequentially moving the pixel of interest; and

a color-blur reduction processing circuit reading data of pixels, each of the pixels having data from all the element colors, the pixels being within a predetermined range having the pixel of interest, detected as the color blur pixel, as a reference pixel, then performing calculation to reduce a color blur, and updating data of the pixel of interest stored in said memory with calculated data,

wherein said color-blur pixel detection unit detects said color blur pixel based on change rate of element color intensity for a low-density color filter, between closely adjacent pixels.

13. (currently amended): An image processing method for performing image processing on image data consisting of dot-matrixed pixels, each of the dot-matrixed pixels having color element data from all element colors, the dot-matrixed pixels being output from an input device which generates the image data by obtaining image data by a single-plate solid image pickup device where a plurality of color filters of element color components are arranged in mosaic in nonuniform densities and supplementing the image data by calculation to change the nonuniform densities to uniform densities, said method comprising the steps of:

detecting a color blur pixel in said image data; and

performing image processing on pixels, each of the pixels having data from all the element

colors, the pixels being within a predetermined range having said color blur pixel as a reference pixel so as to reduce a color blur,

wherein said detection of said color blur pixel is based on change rate of element color intensity for a low-density color filter, between closely adjacent pixels.

14. (currently amended): A medium containing an image processing control program for an image processing apparatus performing image processing on image data consisting of dot-matrixed pixels, each of the dot-matrixed pixels having color element data from all element colors, the dot-matrixed pixels being output from an input device which generates the image data by obtaining image data by a single-plate solid image pickup device where a plurality of color filters of element color components are arranged in mosaic in nonuniform densities and supplementing the image data by calculation to change the nonuniform densities to uniform densities, said program executes image processing comprising:

detecting a color blur pixel in said image data; and
performing image processing on pixels, each of the pixels having data from all the element colors, the pixels being within a predetermined range having said color blur pixel as a reference pixel so as to reduce a color blur,

wherein said detection of said color blur pixel is based on change rate of element color intensity for a low-density color filter, between closely adjacent pixels.

15. (previously presented): An image processing apparatus performing image processing on image data consisting of dot-matrixed pixels, each of the dot-matrixed pixels having color

element data from all element colors, the dot-matrixed pixels being output from an input device which generates the image data by obtaining image data by a single-plate solid image pickup device where a plurality of color filters of element color components are arranged in mosaic in a nonuniform densities and supplementing the image data by calculation to change the nonuniform densities to uniform densities, said apparatus comprising:

a color-blur pixel detection unit detecting a color blur pixel in said image data; and
an image processing unit performing image processing on pixels, each of the pixels having data from all the element colors, the pixels being within a predetermined range having said detected color blur pixel as a reference pixel, so as to reduce a color blur,

wherein said image processing unit performs smoothing processing on color difference components, obtained by subtracting luminance components from element color components of the pixels within the predetermined range having said color blur pixel as the reference pixel, and returns the smoothing processed components to initial element color components.

16. (previously presented): The image processing apparatus according to claim 15, wherein said image processing unit performs edge enhancement processing.

17. (previously presented): The image processing apparatus according to claim 16, wherein said image processing unit performs edge enhancement processing on pixels within a range subjected to the smoothing processing.

18. (previously presented): An image processing apparatus performing image processing on

image data consisting of dot-matrixed pixels, each of the dot-matrixed pixels having color element data from all element colors, the dot-matrixed pixels being output from an input device which generates the image data by obtaining image data by a single-plate solid image pickup device where a plurality of color filters of element color components are arranged in mosaic in a nonuniform densities and supplementing the image data by calculation to change the nonuniform densities to uniform densities, said apparatus comprising:

a color-blur pixel detection unit detecting a pixel having a high ΔRB change rate between adjacent pixels, wherein the pixel having the high ΔRB change rate is regarded as a color blur pixel in said image data; and

an image processing unit performing image processing on pixels, each of the pixels having data from all the element colors, the pixels being within a predetermined range having said color blur pixel as a reference pixel, so as to reduce a color blur.

19. (previously presented): An image processing method for performing image processing on image data consisting of dot-matrixed pixels, each of the dot-matrixed pixels having color element data from all element colors, the dot-matrixed pixels being output from an input device which generates the image data by obtaining image data by a single-plate solid image pickup device where a plurality of color filters of element color components are arranged in mosaic in nonuniform densities and supplementing the image data by calculation to change the nonuniform densities to uniform densities, said method comprising:

detecting a pixel having a high ΔRB change rate between adjacent pixels, wherein the pixel having the high ΔRB change rate is regarded as a color blur pixel in said image data; and

performing image processing on pixels, each of the pixels having data from all the element colors, the pixels being within a predetermined range having said color blur pixel as a reference pixel so as to reduce a color blur.

20. (previously presented): A medium containing an image processing control program for an image processing apparatus performing image processing on image data consisting of dot-matrixed pixels, each of the dot-matrixed pixels having color element data from all element colors, the dot-matrixed pixels being output from an input device which generates the image data by obtaining image data by a single-plate solid image pickup device where a plurality of color filters of element color components are arranged in mosaic in nonuniform densities and supplementing the image data by calculation to change the nonuniform densities to uniform densities, said program executes image processing comprising:

detecting a pixel having a high ΔRB change rate between adjacent pixels, wherein the pixel having the high ΔRB change rate is regarded as a color blur pixel in said image data; and

performing image processing on pixels, each of the pixels having data from all the element colors, the pixels being within a predetermined range having said color blur pixel as a reference pixel so as to reduce a color blur.